Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1.(currently amended) Modular and software definable pre-amplifier apparatus ~~(used to perform audio signal conditioning before being output to power amplification and or headset means)~~ comprising:

(a) one or a plurality of software ~~and~~ or firmware definable logic blocks, these logic blocks being based on ~~Programmable Logic Devices (PLDs), such as Field Programmable Gate Arrays (FPGAs)~~programmable logic devices, which ~~can be~~are configured in at least one of real time and ~~or~~ non real time to implement in hardware different signal processing functions required for at least one of different digital signal processing algorithms and ~~or~~ different audio processing protocols, ~~such as Dolby noise reduction, AC3, MPEG2, MP3, MPEG4, Home Theatre, various types of digital filters,~~ thus allowing the apparatus to be used in different audio system configurations, the programmable logic ~~optionally~~ providing hardware acceleration of complex and software intensive functions, the configuration of the software definable logic blocks being performed by either ~~firmware~~configuration data stored in local memory associated with the programmable logic devices ~~and~~ or by the

host processor transferring the configuration data to the programmable logic devices directly or indirectly to local memory associated with the programmable logic devices or via a JTAG port of the programmable logic device, the choice of configuration ~~firmware~~ program depending on the user selected parameters~~, these parameters being entered into the apparatus via either an integrated keypad and front panel controls and or via remote control means, or personal computer means, the input information being displayed on display means, such as an Liquid Crystal Display (LCD), the software definable logic blocks optionally incorporatingdigital signal processor (DSP) devices and associated memory devices, the configuration and allocation of the software programs used by each digital signal processor device being performed in real time and or non real time by the host processor or configuration routines stored in non-volatile memory associated with the digital signal processors, the allocation of the specific software program being determined by user inputs~~; and

(b) a host processor and associated program memory means for controlling, monitoring and configuring the apparatus.

2.(currently amended) Modular and software definable pre-amplifier apparatus as claimed in claim 1, ~~having~~further comprising integrated ~~memory means, such as a~~ hard disk drive

memory means~~and~~ or non-volatile semiconductor memory means~~and~~ or volatile semiconductor memory means for storing and retrieving ~~digitised~~digitized audio data signals.

3. (currently amended) Modular and software definable pre-amplifier apparatus as claimed in Claim 1, further comprising ~~having~~ mezzanine ~~and~~ or card modules ~~which allows~~that allow the apparatus to be expanded or ~~upgrade~~upgraded for use with other protocols or for adding more audio output channels and or accommodating more source channel interfaces, is accomplished by interfacing mezzanine or card modules to the apparatus, these mezzanine ~~and~~ or card modules containing any combination of the following circuitry:

1) Digital Signal Processors,
2) Memory,
3) Programmable Logic Devices (PLDs)
4) Interface logic,
5) Analogues to Digital Converter (ADC),
6) Digital to Analogues Converter (DAC),
7) Small signal amplification and ~~or~~ filter circuitry.

4. (currently amended) Modular and software definable pre-amplifier apparatus as claimed in Claim 1, ~~which includes~~further comprising modem means, allowing Internet access so the user ~~to~~can download upgrade firmware or software

for implementing new audio protocols ~~and~~ or configuring the programmable logic hardware, ~~and or signal processing algorithms~~ allowing the programmable logic and processing elements in the apparatus to be reconfigured to implement the new algorithms and or hardware configurations, the new firmware and software being stored in non-volatile memory under the control of the host processor and controller circuitry, the Internet access also allows the user to download audio information, ~~such as MP3 data,~~ which ~~can~~is then ~~be~~ processed and ~~optionally~~ stored by the apparatus ~~before being output to other apparatus, such as a power amplifier and or headset~~.

5. (currently amended) Apparatus as claimed in Claim 1, further comprising ~~which has the~~ facilities to allow removable memory means containing non-volatile memory~~such as a PC TYPE 1 2 / 3 card or memory stick©~~ to be inserted into the apparatus and removed from the apparatus, previously stored data being read from the removable memory means and processed by the apparatus ~~before being output~~, ~~alternatively~~or processed music data ~~and~~ or ~~digitised~~digitized audio signals, formatted in ~~the~~a selected format, ~~can be~~are stored in the non-volatile memory, ~~in the removable memory card~~ allowing the user to play the recorded data on another apparatus which has the

facilities to access the data stored on the removable memory ~~card~~ means.

6. (currently amended) Apparatus as claimed in Claim 1, wherein ~~in which~~ the software ~~and~~ or firmware definable ~~devices~~logic blocks are full custom VLSI devices ~~and~~ or Application Specific Integrated Circuits (ASICs) which implement any Combination of programmable logic, fixed standard cell logic, mixed signal circuitry and processor cores.

7. (currently amended) Apparatus as claimed in Claim 1, ~~in which the~~further comprising input circuitry ~~and~~ or output circuitry ~~is~~ based on programmable logic ~~devices, such as Field Programmable Gate Arrays (FPGAs)~~, allowing ~~the~~ interfaces to be reconfigured to implement the desired interface protocol or format.

8. (currently amended) Apparatus as claimed in Claim 1, wherein ~~in which~~ the apparatus ~~can be~~is configured for simultaneous use by more than one user where signal data from one or more signal sources ~~can be~~is processed and output to one or more output circuits.

9. (currently amended) Apparatus as claimed in Claim 1, wherein ~~in which~~ an external modem means is employed to access the Internet.

10. (currently amended) Apparatus as claimed in Claim 1, wherein ~~which uses~~ feedback signals are provided from remote microphone means to allow the signal ~~processing means~~processor devices to adapt in real time the sound of ~~the~~ played music to ~~the~~ desired acoustical settings.

11. (currently amended) Apparatus as claimed in Claim 1 which incorporates analogue to ~~Digital~~digital converter (ADC) means to allow analogue input signals to be first converted to digital signals ~~so they can be~~and processed in the digital domain, the sampling frequency of the ~~Analogue~~analogue to ~~Digital~~digital ~~Converter)~~converter means (ADCs) being sufficient to accurately represent the signal in the digital domain.

12. (currently amended) Apparatus as claimed in Claim 1, wherein ~~in which the~~ input ~~signal~~signals to the apparatus from source means ~~and~~ or ~~the~~ output signals from the apparatus to signal sink means is by wireless communication means.

13.(currently amended) Apparatus as claimed in claim 12, wherein ~~in which the wireless protocol used to~~ transfer of data to and from the pre-amplifier apparatus is according to Bluetooth, HomeRF, IEEE 802.11, DECT or Wireless ATM protocol.

14. (currently amended) Apparatus as claimed in Claim 3 wherein the mezzanine ~~card and~~ or card ~~module~~modules have interface means ~~are~~ based on programmable logic, ~~for example Field Programmable Logic Arrays (FPGAs)~~ so that upgrades ~~can be~~are easily implemented by changing the interface ~~devices~~means of the associated mezzanine or card module ~~and or mezzanine card~~.

15. (currently amended) Apparatus as claimed in Claim 1, ~~in which~~wherein the ~~signal processing~~logic blocks are programmed and or configured to implement reverberation and echo effects.

16. (currently amended) Apparatus as claimed in Claim 1, wherein ~~which~~ the ~~signal processing~~logic blocks are programmed and ~~or~~ configured to emulate the acoustic characteristics of a valve amplifier and alter the output signals so they sound as if they were produced by a valve amplifier.

17. (currently amended) Apparatus as claimed in Claim 1, wherein ~~in which~~ a personal computer (PC) ~~can be~~is connected to allow control of the apparatus, reconfigure the apparatus, diagnose the apparatus ~~and~~ or download or upload music data, which ~~can be~~are processed or stored in internal memory ~~form~~for future use.

18. (currently amended) Apparatus as claimed in claim 1, wherein ~~in which the~~ remote control means ~~can be~~is used to control ~~the~~ peripheral signal source apparatus~~, such as a compact disc player~~ via the pre-amplifier apparatus.

19. (currently amended) Apparatus as claimed in Claim 1, wherein~~in which~~ digital switching means are employed to route and transfer data from ~~different sub-blocks, card modules and or devices in~~ the apparatus.

20. (currently amended) Apparatus as claimed in claim 19, wherein ~~in which~~ the digital switching means takes the form of a cross bar switch or a self-routing switch in which data packets or cells have an appended routing tag to control the flow of the ~~packet~~packets or ~~cell~~cells through the ~~self-routing~~ switch to ~~its~~their destination.

21. (currently amended) Apparatus as claimed in claim 20, wherein ~~in which~~ the digital switching means uses priority output queues to allow data with different priorities to be queued in separate queues to reduce congestion and head of line blocking.

22. (currently amended) Apparatus as claimed in Claim 19, wherein ~~in which~~ digital data for transfer via switching means is encapsulated as a variable length data packet or same length cell.

23. (currently amended) Apparatus as claimed in Claim 1, ~~that incorporates~~further comprising an integrated ~~read and optionally write-able~~read/writable compact disc transport and associated control circuitry to allow stored ~~digitised~~digitized audio data to be read ~~and~~ or written to ~~a~~ compact disc ~~(CD)~~ media.

24. (currently amended) Apparatus as claimed in Claim 1, ~~that incorporates~~further comprising an integrated ~~read and optionally write-able~~read/writable Digital Versatile Disc ~~(DVD)~~ transport and associated control circuitry to allow stored ~~digitised~~digitized audio data to be read ~~and~~ or written to ~~a~~ Digital Versatile Disc ~~(DVC))~~ media.

25. (currently amended) Apparatus as claimed in Claim 1, ~~where~~wherein peripheral units are situated remotely from the pre-amplifier apparatus in which control and data messages are transferred by wireless means allowing movement of the said remote peripheral units to different locations ~~within the use's house without the need to re-wire the apparatus~~.

26. (currently amended) Apparatus as claimed in Claim 3, wherein the mezzanine ~~cards and~~ or card modules incorporate "Plug and Play" means to allow a mezzanine ~~card and~~ or card module to configure and ~~initialise~~initialize itself and interact with the host processor ~~means~~ to indicate the configuration, status and functionally of the ~~card module and associated~~ mezzanine or card modules.

27. (currently amended) Apparatus as claimed in Claim 3, wherein the mezzanine ~~cards and~~ or card modules incorporate ~~the~~ means to be hot swappable, allowing card module insertion or removal from a card frame of the apparatus ~~card frame~~ while the apparatus is operational.

28. (currently amended) Apparatus as claimed in Claim 1, wherein~~in which the apparatus can have~~ some of the logic devices are~~programmable circuitry~~ configured to implement

functions and ~~or~~ algorithms normally performed in "conventional" peripheral equipment, allowing new peripheral equipment which operates with ~~the~~ said modular and software definable pre-amplifier apparatus to have reduced functionality.

29. (currently amended) Apparatus as claimed in Claim 1, wherein~~in which~~ the apparatus ~~can be~~is programmed to record data using "non-volatile" memory means at a predefined time from a peripheral device ~~so it can be retrieved, processed and listened to at a later time~~.

30. (canceled)

31. (new) Apparatus as claimed in claim 1, wherein said software definable logic blocks include digital signal processor devices and associated memory devices, the configuration and allocation of the software programs used by each digital signal processor device being performed in real time or non real time by the host processor or configuration routines stored in non-volatile memory associated with the digital signal processor devices, the allocation of the specific software program being determined by user inputs.